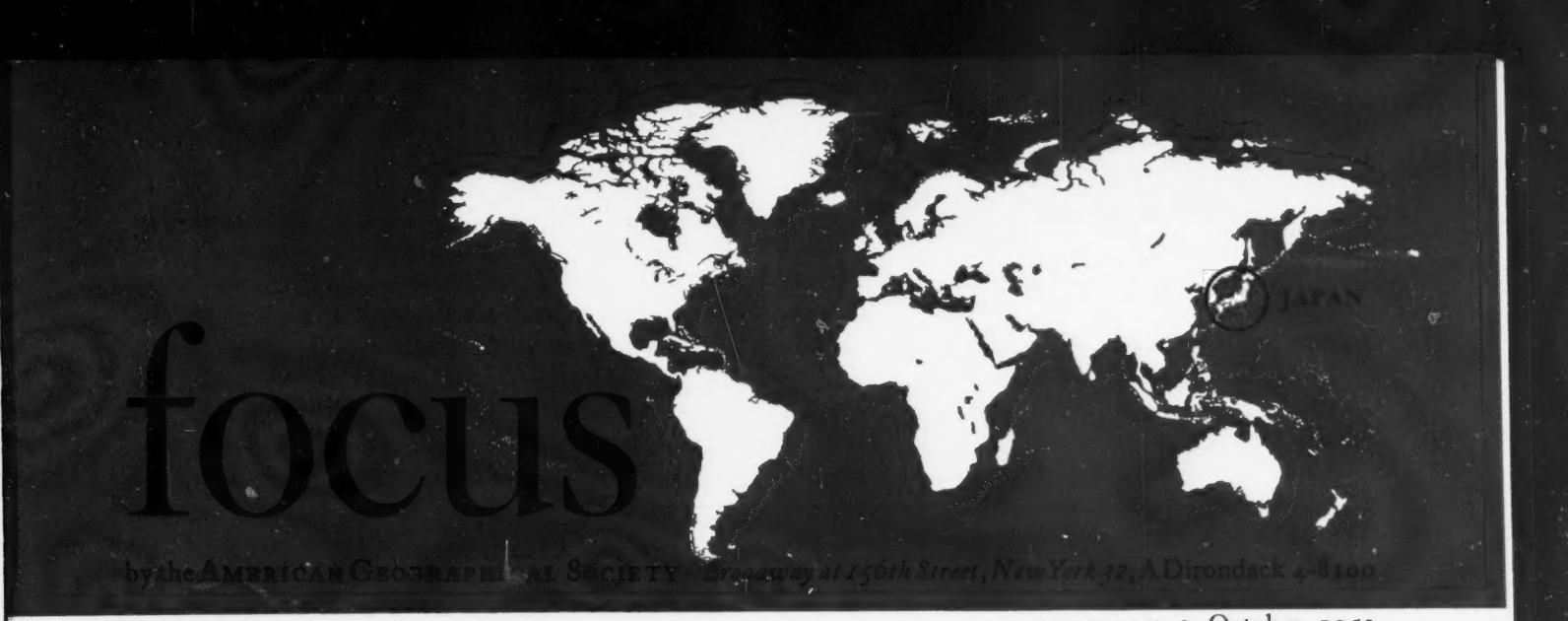

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by the AMERICAN GEOGRAPHICAL SOCIETY Broadway at 156th Street, New York 32, ADirondack 4-8100

ALICE TAYLOR, EDITOR

VOL. III, NO. 2, October, 1952

Japan

When Commodore Perry visited Japan in 1853, he found a nation of about 30 million people living much as they had lived for three centuries. More than three-quarters of them were poor farmers, who cultivated tiny plots of rice with the most primitive of tools, paid exorbitant rentals to their landlords, and were virtually the slaves of the ruling class. Handicrafts supported a small segment of the population in the towns; there was practically no trade with the outside world.

By 1935, Japan had become a top-rank industrial power; her population had more than doubled, and one-quarter of her people were engaged in industry. Few nations in the modern world have undergone such a speedy and dramatic transformation.

One may well wonder how it was done, in so short a time, and on such meager resources—and meager they certainly are, in almost every field.

In the first place, in a country where agriculture has always been, and still is, the backbone of the economy, there is a scarcity of level land. A rugged central core of uplands and mountains, with many peaks more than 10,000 feet high, occupies about three-quarters of the total 142,000 square miles. While their wild beauty and charm have inspired many an artist and attracted many a tourist, unfortunately they are of little value for cultivation and can feed no more than a quarter of Japan's 85 million people. The remaining three-quarters of them are crowded into the narrow river valleys and the coastal plains, an area smaller than the state of Maine.

In the second place, the area of fertile soils is extremely limited. It is only the young alluvial loams, silts, and clays of the easily irrigated plains and deltas that are highly valued for agriculture. Most of the upland soils are deficient in lime, nitrogen, and organic matter. In Hokkaido and western Honshu, the gray forest and moor soils suffer severely from these defects, and, furthermore, they are subject to erosion where the natural forest mantle has been removed. The brown soils of eastern Honshu and the red and yellow soils in the south are somewhat more productive, but by no stretch of the word could they be called fertile.

Japan is fortunate, however, in one respect, namely in her climate. Rainfall is well distributed throughout the year: winter rain is brought in by cyclones which originate over the Chinese mainland, as well as by the northerly monsoon, which picks up some moisture as it crosses the Japan Sea; in summer the prevailing southerly monsoon brings in moisture from the Pacific. As no part of the archipelago is more than 100 miles from the coast, large parts of which are washed by the warm Japan Current, very cold and very hot

weather is rare. Sapporo, in Hokkaido, closely resembles St. Johnsbury, Vermont, in both winter and summer, and has about the same length of growing season (120 days). Tokyo resembles Winston-Salem, North Carolina, with a growing season of 215 days; and Kagoshima in the extreme south, is similar to Birmingham, Alabama, with a growing season of approximately 250 days a year.

These generally favorable climatic conditions are partly offset, however, by the annual typhoon menace. Once or twice a year, in late summer or early fall, the country is liable to be devastated by violent wind storms (comparable to West Indian hurricanes), which beat down the ripening rice, flood the fields, and often wipe out whole villages.

On top of this, the Japanese farmer has to contend with volcanic eruptions, frequent earthquakes, and tidal waves.

He also has to survive on a minute portion of land. Because barely 16 per cent of the country is arable, the average farm is only 2½ acres (as compared with 155 in the United States). In Hokkaido farms are somewhat larger than average, but elsewhere most of them are smaller, and along the Inland Sea many are less than 1½ acres.

In spite of these handicaps, Japan contrives to grow prodigious quantities of agricultural produce, and to do so with the simplest of tools and techniques. But what the Japanese farmer may lack in these respects he makes up for with dexterity, patience, and hard labor. Almost every operation on the farm is carried out by hand. The seedlings are carefully transferred from nursery beds, constantly weeded, spaded, and fertilized. And the fertilizer (fish waste, soybean extract, composts, night soil, or chemical fertilizer), instead of being spread over the field, is poured directly over the growing plant so as to avoid wastage. The result is that yields are two or three times larger than they are in the "rice bowls" of Indochina and Burma, and, in fact, are the highest in the world.

Because the raising of food is such a critical job in Japan, the farmers have concentrated mainly on rice, whose caloric yield per acre is higher than that of any other grain. More than half the total cultivated area is planted in rice; and 96 per cent of this is irrigated lowland rice. On the better-favored uplands, dry rice is rotated with wheat and barley, and there is some cultivation of potatoes, mulberry, tree fruits, tea, and tobacco. On the lowlands of Honshu and Kyushu, where two, even three, crops a year can be grown, wheat, barley, rape, beans, or clover are planted after the rice has been harvested.

Because good level land is so scarce, the mountains so close, the slopes so steep, and rainfall abundant, the Japanese farmer has developed a healthy fear of erosion. The upper slopes around his fields are kept well covered with trees and grass; the lower slopes, where cultivated, are carefully and intricately terraced; and as the streams emerge onto the plains, they are stringently held within bounds by embankments.

With all his ingenuity and labor, the Japanese farmer has difficulty in making ends meet. Before the Allied occupation he was struggling under an almost impossible system of land rentals. Only about a third of the farmers owned any land at all; the rest of them usually had to provide their own house, farm buildings, tools, seed, and expensive fertilizer, and still manage to turn in 50 per cent of their rice crop to the landlord. Since the Land Reform Law of 1946, initiated by the occupation forces, conditions have greatly improved. Absentee landlords were forced to sell land to the government; the size of owner-cultivator holdings was limited so as to place the greatest possible amount of land in the hands of former tenants. Rentals in the form of crops were eliminated; cash rentals were regulated so that they would not exceed 20 per cent of the value of the rice crop and 15 per cent of the other crops. By 1951 more than 3 million farmers had bought land at easy rates of interest, and tenancy had been cut to 12 per cent.

Nonetheless, life is not easy. As may be seen in Fig. 1, the average population density is extremely high, especially along the Inland Sea and the east coast of Honshu. And density per square mile of arable land is the highest in the world: 3,000, as compared with 2,400 in Great Britain, and 240 in the United States. Population pressure is overwhelming. Furthermore, the population is constantly and rapidly increasing, and the food problem grows yearly more acute.

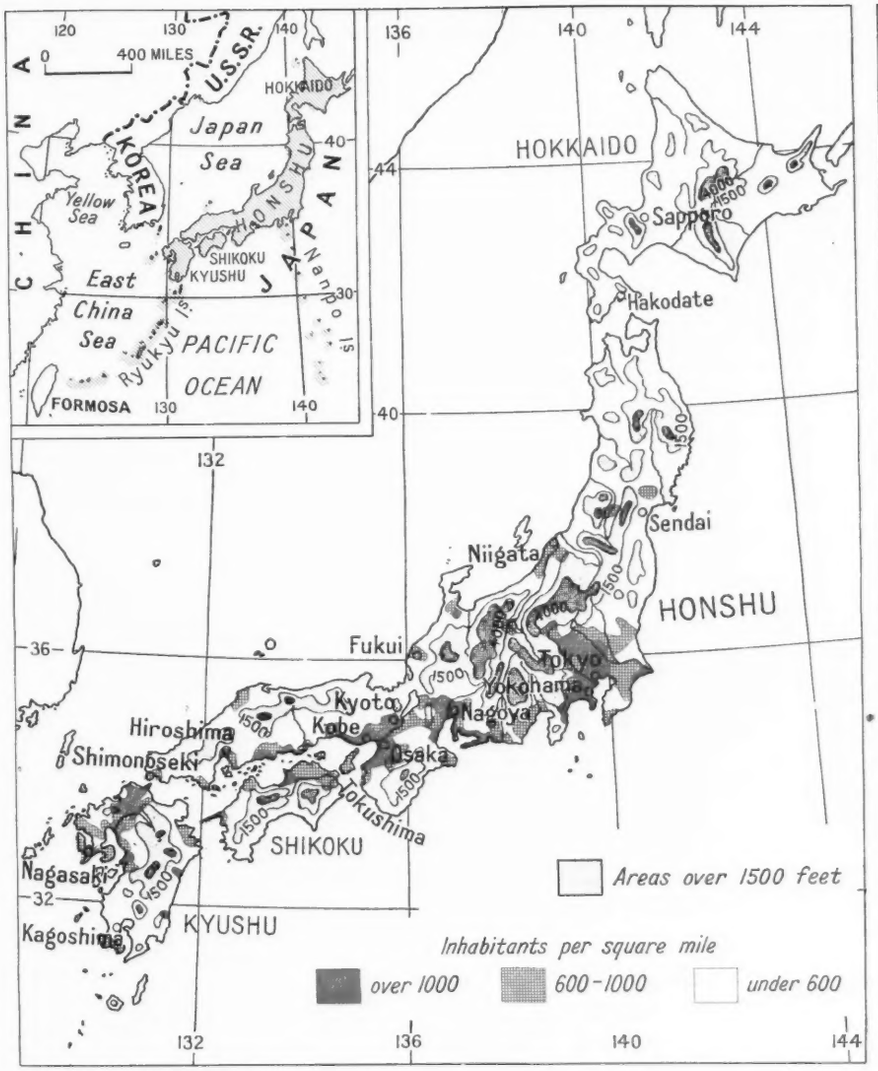
Since the food value derived from a given amount of grain is several times greater than that of the milk or meat produced by feeding that grain to animals, it is obviously not in the average farmer's interest to raise livestock. Fortunately, the nation's protein requirements can be met by the fish which abound in Japanese waters: the per capita consumption of fish is no less than 60 pounds a year. The shallow Japan Sea and the lacelike coastline, dotted with hundreds of islands and harbors, are especially good fishing grounds, and the meeting of the warm Japan and cool

Okhotsk Currents attracts a wealth of marine life. In addition to the local catch (mainly herring, sardines, mackerel, and cod), which is taken by craft of every size and description, there are fleets of vessels trawling in the North Pacific for tuna and otter, huge floating factories turning out salmon and crabmeat, and whalers as far afield as the Antarctic. Although overfishing and restrictions imposed by the Allies have cut production to some extent in recent years, the annual total catch is still one of the largest in the world.

With all this, Japan is unable to produce enough food to feed her people. At best she can meet 80 per cent of her minimum requirements; the rest must come from imports.

It was partly to make good this deficiency (which, of course, is nothing new) that Japan set out to become an industrial nation. Shortly after Commodore Perry's visit, the worst aspects of the old feudal regime were cleared away. Experts were invited to Japan, and students were sent abroad to learn the technology of textiles, steel, and a dozen other industries. Machinery and equipment for all these industries were imported. Mines were opened up and developed, and machine shops were built. By the beginning of World War I, when her European competitors were otherwise occupied, Japan was ready and able to capture many of the Far Eastern markets which they had formerly monopolized. The production of coal and steel mounted sharply, as did that of the food processing, cotton, silk, engineering, and chemical industries. National income and wealth increased by leaps and bounds.

However, as the industrial machine moved into high gear, it became clear that serious troubles lay ahead and that shortages of basic supplies within the country might well prevent further expansion.



Maps drawn by John Forsyth

FIG. 1—Relief and population

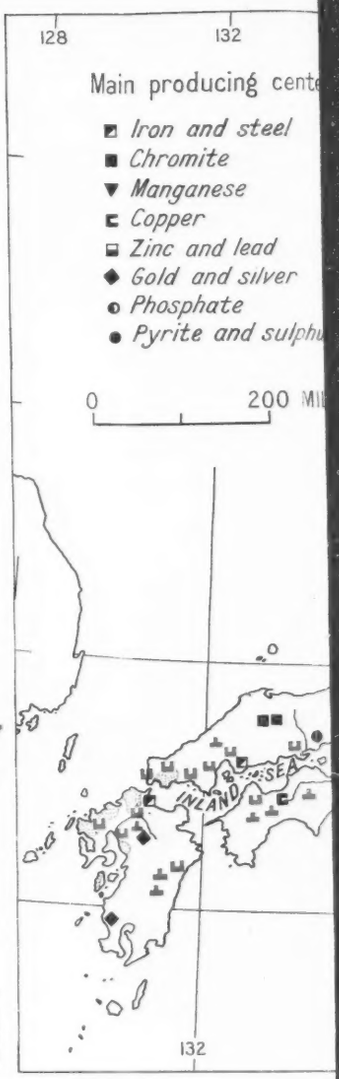


FIG. 2—Fuels,

Luckily there was no great fuel problem. More than half the country was (and still is) forested, and nearly 50 per cent of all the timber consists of dwarf woods fit for fuel. Wood and charcoal continue to be the principal heating and cooking fuels for the ordinary household.

Coal, the most important mineral in Japan, is widely distributed, as may be seen in Fig. 2; output is enough to supply 95 per cent of the domestic requirements. However, production costs are rather high and the quality rather poor (low heat value and high ash content) , and practically none of the coal can produce coke suitable for large blast furnaces. Coking coal therefore must be imported.

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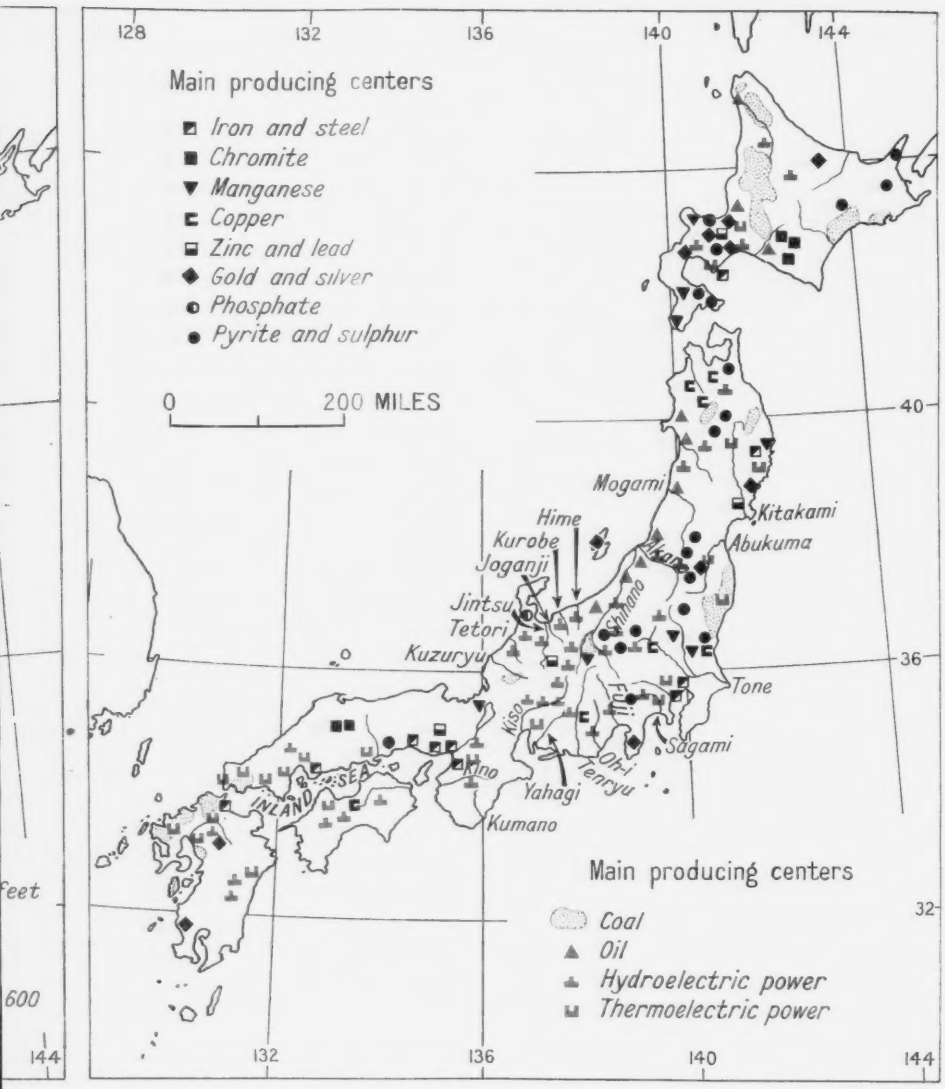

FIG. 2—Fuels, electric power, and principal minerals

small; in fact, half of them produce less than 1,000 kilowatts. But they are so widely dispersed throughout the country that there is hardly a Japanese home without electricity. Since those within easy reach of Tokyo, Kyoto, Osaka, Kobe, and the other large consuming and industrial centers are small and unable to meet manufacturing needs, more than 300 thermal plants have been built to supplement them.

As for raw materials, Japan is in much poorer shape. True, the forests yield large amounts of wood for construction purposes, and for the pulp, paper, and rayon industries, but not enough to satisfy all Japanese requirements in these fields; hence considerable quantities of wood have to be imported.

Japan is also favored with an abundance of pyrite and sulphur, basic to the chemical industry; and adequate amounts of zinc, limestone, gypsum, chromite, and arsenic are available.

But, in general, Japan's industrial deficiencies loom far larger than her assets. Besides a shortage of wood, coking coal, liquid fuels, and lubricants, she is wholely or partly lacking in aluminum, asbestos, iron, lead, tin, nickel, potash, phosphate, salt, fibers, and rubber. And it is only by dint of costly operations that she can produce enough gold, copper, manganese, and silver.

How she tried to resolve her industrial problems, all the world knows. In 1931, when the Japanese army struck in Manchuria, the country was laboring under a top-heavy load of imports, and was feeling the full force of the great depression. Only a few years afterwards, with the profits derived from the resources of Manchuria, and later northern China, she succeeded not only in modernizing her existing plant, but in

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the west coast of Honshu near Niigata are small and scattered. Few of the wells flow, costs are high, and the pickings meager. At most production can fill a third of the country's needs; the rest must come from overseas.

Thanks to her rugged topography and abundant, year-round rainfall, Japan is well supplied with hydroelectric power. Scores of swift mountain streams offer good plant sites. Most of the power stations depend entirely on stream flow and their output consequently tends to be irregular; little is done about storage because such facilities are constantly in danger of being demolished by earthquakes, and every inch of valley land is wanted for cultivation. The great majority of the more than 1400 plants are

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expanding it and increasing production in almost every industry, particularly fertilizers, textiles, machinery, metallurgy, and chemicals. This increase was reflected in the growing volume of her exports in the 1930's. During this same decade, Japan more than doubled her electric generating capacity, accumulated huge stockpiles of raw materials, and was producing in the conquered countries enough iron, coking coal, salt, and other vital commodities to meet her needs. Many others, however, still had to come from overseas, and did so, in ample quantities, until the early 1940's, by which time she was beginning to feel the effect of the Allied sea blockade. Once the shipping lanes were cut, supplies of food and raw materials dropped almost below the survival point.

In 1945, Japan faced a pretty desperate situation. Her colonies were gone, her merchant marine was practically wiped out, hundreds of thousands were homeless and jobless, industrial production was barely half that of prewar days. Worse, so many of the factories had been geared to war production since 1937 that few of them were equipped to turn out consumer goods, and of these a number had been destroyed by aerial attacks. However, thanks mainly to the large United States subsidies for the purchase of machinery, food, fertilizer, and cotton, Japanese industrial activity has revived; the balance of foreign trade has improved; and both imports and exports have risen. Today the country is on its way to recovery.

But Japan is still up against very real problems. In order to achieve a decent standard of living for her population she will need to use more efficiently every natural resource in the country. She will need to bring more land under cultivation and pasture (particularly in Hokkaido), to diversify and still further intensify her agriculture, to modernize her fishing methods, to develop better ways of processing and preserving foods, to increase the output of mines already in production and develop new ones, and by dint of better forest management increase the annual cut of wood.

She has other needs as well, paramount among them in the view of many Japanese being a reduction of the present birth rates. But until her population is stabilized, what she needs most of all is access to overseas markets that will enable her better to export her manufactured goods and supply her own requirements of raw materials.

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